conducted in Europe. **RESULTS:** The search identified 25.135 articles, 889 titles were included for further screening and 409 abstracts for the article review step. A total of 308 abstracts did not meet the inclusion/exclusion criteria, leaving a pool of 101 articles for full text evaluation. Overall, 10 systematic reviews were identified, with 238 primary studies, 129 conducted in Europe. The sample sizes from the included primary studies from Europe revealed 20 to 15.343 patients with a mean of 514. Chronic conditions investigated were: heart failure, chronic obstructive pulmonary disease, diabetes, and cancer. Of the outcomes more frequently studied, integrated care appeared to improve quality of life and reduce hospitalization. But often results remained inconclusive. **CONCLUSIONS:** Providing a conclusion across the different chronic conditions is not possible. Therefore, only disease specific conclusions can be drawn. Our review suggests that integrated care might be advantageous for specified groups of patients, e.g. heart failure. Furthermore, it remains unclear which specific component is associated with the highest benefit for patients across chronic conditions.

PHS72

AGE-RELATED EMERGENCY DEPARTMENT RELIANCE (EDR) AND HEALTH CARE RESOURCE UTILIZATION IN PATIENTS WITH SICKLE CELL DISEASE (SCD)

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OBJECTIVES: For SCD patients, inadequate care during pediatric to adult transition may result in increased emergency department (ED) utilization. Emergency department reliance (EDR: total ED visits/total ambulatory [outpatient+ED] visits) identifies the proportion of ED visits in relation to all ambulatory visits. This study aimed at investigating age-related patterns of EDR and associated health care costs in SCD patients. **METHODS:** State Medicaid data from Florida, New Jersey, Missouri, Iowa, and Kansas were analyzed. Patients with ≥2 SCD diagnoses (ICD-9 282.6x) and ≥1 blood transfusion were included. Quarterly rates of EDR and SCD complication-related ED visits as well as health care costs were evaluated. Based on published thresholds, high EDR was defined as >0.33. Regression analyses were used to assess risk factors for high EDR and calculate adjusted costs difference between patients with high versus low EDR. **RESULTS:** A total of 3208 patients were identified; mean (SD) observation period was 6.5 (3.2) years. Mean ED visits/quarter increased from 0.76 to 2.23 between age 15 and 23, reaching a peak of 2.9 at age 36. The most common SCD complication-related ED visits were pain, infection, and pneumonia. EDR rose from 0.15 to 0.29 between age 15 and 23, and remained high thereafter. Patients were more likely to have high EDR during the post-transition period (≥18 years old, odds ratio [OR]: 2.38, p<0.001) and when experiencing an SCD complication (OR: 4.18, p<0.001). Patients with high EDR incurred higher inpatient and ED costs, resulting in higher total costs (high vs. low EDR, adjusted costs difference, OP: -$285; IP: $3,485; ED: $120; Rx: -$91; total: $3,086, p<0.001 for all). **CONCLUSIONS:** Compared to children, SCD patients transitioning to adulthood relied more on ED for their care and those with high EDR incurred higher health care costs, highlighting the need to improve access to care for transitioning and adult SCD patients.

PHS73

PHARMACIST-LED SERVICES TO PATIENTS WITH RESPIRATORY DISEASES: FEASIBLE FROM A QUALITY AND REIMBURSEMENT PERSPECTIVE?

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OBJECTIVES: Pharmacists are qualified to provide many services that are core to integrated care models. Expanding services to diverse patient populations will increase pharmacists' value. This study describes the experience, preliminary outcomes and revenue model justification associated with the implementation of pharmacist-led care for patients with respiratory disorders. **METHODS:** Medical and billing record review was performed on patients with respiratory symptoms referred to the pharmacist from May 2011 to September 2012 within a community-based, medical home, primary care practice. Patients referred were those with respiratory symptoms in which the physician sought objective lung function data and additional support to assist in properly diagnosing and treating the patient. Pharmacist interventions included collection of a detailed pulmonary and medication history, spirometry, and on applicable patients, disease state education, medication care plans and device education, and smoking cessation. Outcomes described included quality and results of spirometry testing, pharmacist recommendations, recommendations for specialist care and payment for services. **RESULTS:** Thirty-four patients (76.5% female; mean age=49.6±17.6) were seen by the pharmacist and assessed by spirometry. Spirometry met American Thoracic Society quality measures in 82.5% of tests with the following results: 64.7% normal, obstruction (8.8% mild, 14.7% moderate, 2.9% severe), and 8.8% probable restriction. Pharmacist recommendations that were implemented included the use of short-acting-beta-agonists (23.5%), corticosteroids (20.6%), anti-cholinergics (14.7%), and long-acting-beta-agonists (11.8%). Smoking cessation was recommended for 11.8% of patients and 44.1% received specialist referrals. The mean overall payment for the services provided at these visits was $144.43±36.34. **CONCLUSIONS:** Pharmacist involvement in the care of patients with respiratory disorders provided valuable, quality lung function data and care plan recommendations to physicians and education to patients. These preliminary results support the pharmacist expanding their role in the medical home by providing physician/patient care services, including spirometry, to patients with respiratory disorders from both a clinical and economic perspective.

PHS74

DRUG-RELATED PROBLEMS AND MEDICATION ERRORS: A LITERATURE REVIEW ON ECONOMIC OUTCOMES IN SUB-SAHARAN AFRICA

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OBJECTIVES: To review the literature published within the last decade related to drug-related problems and medication errors in Sub-Saharan Africa. This article provides a discussion on pharmaceutical care, with a focus on economic outcomes. **METHODS:** A search using Medline, Embase was conducted over the timeframe January 2002–December 2012 using key words such as: Sub-Saharan Africa, medication errors, economics, and pharmaceutical care. The abstract and/or full text of each article was reviewed. **RESULTS:** Twenty studies were identified for review. The most common problems in the pharmacy system were improper labeling, counterfeit drugs, lack of patient education, and inadequate drug distribution. The lack of electronic medical records and payment systems prevent the assessment of clinical cost outcomes. In a study conducted by the University of Benin, of 1500 pharmacists, 93% reported that they would be willing to participate in "any training program to enable them to practice pharmaceutical care." There is a lack of pharmacists able to provide pharmaceutical care as defined as the direct, responsible provision of medication-related care designed to achieve definite outcomes. The shortage of pharmacists is due to few training institutions, migration, inadequate pay and poor working conditions. Specifically, 25% of the world's global burden of disease is in Sub Saharan Africa, while this area comprises 3% of the world's health workers. These factors contribute to an increase in medication errors. **CONCLUSIONS:** Sub-Saharan Africa lacks the necessary governmental regulation to ensure a decrease in medication errors. The government may consider streamlining their drug distribution system through the enforcement of regulations and the use of information technology in the health care delivery system. Additional studies are needed to examine economic outcomes. Several studies provide information on cost effectiveness and quality of life, but these studies are specific to the HIV/AIDS population.

PHS75

HEALTH CARE FRAUD 2006 TO 2011

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OBJECTIVES: Health care fraud is a long-standing problem, accounting for $75 billion in 2009. Congress amended the False Claims Act (FCA) in 1986 to allow qui tam relators ("whistleblowers") to receive up to 30% of anti-fraud recoveries. Most studies investigate health care fraud involving the pharmaceutical industry, so it has not been possible to contextualize fraud involving health care sectors other than the pharmaceutical industry. Herein, we review all recently concluded major federal health care fraud investigations. **METHODS:** All cases involved health care corporations and federal FCA. Data were collected from Lexis/Nexis News (search terms: "Health care fraud", "False Claims Act" and "Qui tam"), the Taxpayers against Fraud and the DOJ websites (2006-2011). Only cases with recoveries over $5 million ("major cases") were included. Data were abstracted on allegations, financial settlements, occupations of and payments to qui tam relators. Cases are reported separately as qui tam- versus non-qui tam-initiated to document whether the Congressional intent to encourage whistleblowing achieved its intended goal. **RESULTS:** Between 2006 and 2011, 123 major qui tam health care FCA cases concluded, totaling $15.7 billion in recoveries (mean recovery: $128 million). Billing fraud, kickbacks, off-label marketing, and marketing unsafe pharmaceuticals were the most commonly implicated activities. Pharmaceutical manufacturers accounted for 31% of, and $11.3 billion (70%) in recoveries among qui tam relator cases. Also, 52 non-qui tam cases closed in this 5-year period, totaling $3.7 billion in recoveries (mean recovery: $71 million). Implicated activities included fraudulent billing, inappropriate financial relationships, off-label marketing, or marketing unsafe pharmaceuticals. **CONCLUSIONS:** In conclusion, federal investigations of fraud and abuse involving health care are increasing in both depth and breadth, and qui tam relators have an important role in detecting important fraud and abuse.

PHS76

ANALYSIS OF 2011 MEDICAID FEE-FOR-SERVICE OUTPATIENT DRUG UTILIZATION, EXPENDITURES AND PHARMACY REIMBURSEMENT RATES

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OBJECTIVES: The Patient Protection and Affordable Care Act will expand the eligibility of the Medicaid program to millions of Americans in 2014. Utilizing more generic drugs and setting appropriate pharmacy reimbursement rates could result in substantial savings to the Medicaid program. This study assessed 2011 state-level, fee-for-service Medicaid generic and brand drug utilization and expenditures, and pharmacy reimbursement rates. **METHODS**: Medicaid fee-for-service outpatient pharmacy utilization and expenditures, and reimbursement rates (ingredient cost and dispensing fees) for the year 2011 were extracted from state-level data provided from the Centers for Medicare and Medicaid Services. Descriptive analyses were performed for all variables in the data set. Linear regression analysis was performed to assess the relationship between ingredient cost, dispensing fees and drug utilization. The significance level for variables was 0.05. **RESULTS**: Fee-for-service Medicaid expenditures (n=46 states) reached $27.8 billion with drug utilization accounting for 173.4 million claims in 2011. Generic expenditures represented 17.3% of total expenditures (range=10.3%-29.2%) and

generic utilization 72.2% of the claims (range=66.1%-84.8%). The average price of generic drug was $17.44 (range=$6.25-$29.12), while the average price of brand drugs was $217.07 (range=$105.63-$357.51). The average pharmacy dispensing fee was $4.51±$2.03 for generics and $4.26±$2.03 for brands (range for both=$1.75-$11.50). The ingredient cost was estimated using average wholesaler price (AWP) (n=25), wholesaler acquisition cost (WAC, n=11) and combination AWP/WAC (n=10). We found no statistical significant relationship between the number of claims or the total state expenditures, and the dispensing fee or ingredient cost. **CONCLUSIONS:** Dispensing fees and ingredient cost varied among the different states' Medicaid programs. Those differences were not related to the total utilization and expenditures of the state programs. Appropriate reimbursement and dispensing fee policies encouraging generic utilization could result in substantial saving for the Medicaid program.

PHS77

PAYMENT REFORM AND CHANGES IN HEALTH CARE IN CHINA

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OBJECTIVES: As the health care safety net continues to grow in both depth and breadth, the provider payment system will play an increasing role in the resource allocation of health care in China. This paper is intended to assess the primary effects of payment reform of capitation experiment and the supplementary open enrollment policy in Changde city, China. **METHODS:** In October 2007, Changde employed a capitation approach to pay for health care under the Urban Resident Basic Medical Insurance (URBMI), while the fee-for-service approach was still used by the Urban Employee Basic Medical Insurance (UEBMI) in the city and other programs as well. Using the national URBMI Household Panel Survey from 2008-2010, we conducted a set of difference-in-difference (DD) models to assess the capitation policy effect on cost and utilization outcomes while controlling for other differences between Changde and other cities. **RESULTS:** The study finds the payment reform to reduce its inpatient out-of-pocket cost by 19.7%, out-of-pocket ratio by 9.5%, and length of stay by 17.5%. The total inpatient cost, drug cost ratio, treatment effect, and patient satisfaction showed little difference between FFS and capitation models. The robust tests find the relatively poor health subsample present a similar pattern with the results based on the full sample; as for the population cohort with good and very good self-rated health conditions, the payment reform in Changde has little impact on either providers or patients. **CONCLUSIONS:** We conclude that the payment reform in Changde led to an decrease in the financial burden of patients for inpatient care and improve hospital efficiency, without compromising quality of care. The total cost measures remain no change between capitation and FFS settings, which can be research topics for further studies concerning the long term effect of capitation approaches.

PHS78

PERSISTENCE WITH GLAUCOMA THERAPY IN A LRAGE HEALTH ORGANIZATION IN ISRAEL

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OBJECTIVES: To investigate treatment patterns of glaucoma and persistence to therapy in a large health organization (HMO) in Israel. **METHODS:** A retrospective cohort study, conducted using the electronic medical databases of Maccabi Healthcare Services, a 2 million member HMO in Israel. The study population consisted of all patients who were newly diagnosed with glaucoma between 2003 and 2010 at MHS. Collected data included personal characteristics and demographics, relevant surgical procedures, prescribed and dispensed anti-glaucoma medications, and caregiver characteristics. We investigated quality of care indices including routine ophthalmologist follow up, performance of tonometry tests, as well as persistence to treatment by drug type. Persistence was analyzed by proportion of days covered by drugs during follow up time, ignoring overlaps due to overuse and simultaneous combination of several types of eye drops. **RESULTS:** A total of 11,512 incident glaucoma patients, who were diagnosed between 2003 and 2010 were identified. One quarter of these patients remained naïve through the follow-up period, additional 20% were non-adherent with therapy (covered less than 20% of the follow up time), and only 13% exhibited high persistence (covered at least 80% of the follow-up period). The most common physician was ophthalmologist both at treatment initiation (70% of initial prescriptions were ophthalmologist vs. 7% by general practitioner) and ongoing prescriptions (48% ophthalmologist vs. 22% by general practitioner). **CONCLUSIONS:** The current study demonstrates the potential use of automated medical databases to characterize treatment patterns of glaucoma, illustrate the great variety of drug therapies, and describe adherence to treatment in the community. The increased comorbidity and mortality among these patients has important implication for health authorities for prevention and delivery of health-care services.

PHS79

KNOWLEDGE, AWARENESS AND ATTITUDES TO RATIONAL USE OF DRUG OF PATIENTS AND ITS INFLUENTIAL FACTORS IN BEIJING, CHINA

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OBJECTIVES: To investigate outpatients' knowledge, attitude and awareness on medication and analyze the influential factors. **METHODS:** A total of 711 outpatients who consented to participate the survey were recruited from 306 Hospital of PLA in Beijing between 2009-2012. The self-administered questionnaire was composed of XX questions. Multiple linear regressions were run to explore the influential factors. Data were analyzed using STATA v11.0. **RESULTS:** The outpatients investigated showed a poor cognition on rational drug use. 84.8% of the patients would stop taking drugs by themselves. 60.1% of the patients were aware of adverse drug reactions. Age, urban-rural difference, knowledge of medication, and health status have different degrees of influence on the medication behavior and medication willingness of patients, while family income and health insurance have little influence. Information provided by the patients was compared with the prescriptions. **CONCLUSIONS:** These results suggest that outpatients in China had much misunderstanding about drug use. Patients' education regarding rational drug use is an important issue and deserves urgent improvement. **KEY WORDS:** Outpatients; Cognition; Determin-ants; Rational use of drug; Self-medication.

PHS80

SURGERY AND BIOLOGIC USE PATTERN FOR PATIENTS WITH CROHN'S DISEASE WHO INITIATED TNF ANTAGONISTS IN A MANAGED CARE SETTING IN THE UNITED STATES

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OBJECTIVES: To determine patient demographics and treatment patterns in patients with Crohn's Disease (CD) who initiated biologic treatment with a TNF antagonist (infliximab or adalimumab). **METHODS:** Patients ≥ 18 years with CD (ICD-9:555.X) who initiated a TNF antagonist between January 2007 and December 2008 were identified from the US IMPACT health insurance claims data-base. Two cohorts were identified; those who received CD related surgery (CDSURG) within a 24-month follow-up and those who did not (CDNon-SURG). Patients continuously enrolled for medical and pharmacy benefits during 6 months prior to their first TNF antagonist claim (index claim). **RESULTS:** A total of 812 individuals with CD were followed over a 24-month period, of which 92% were CDNon-SURG and 8% were CDSURG patients. The majority of patients (89%) were 18 to 54 years old with a higher portion of CDSURG patients in the 18-34 age range. CDSURG included younger patients (mean age: 37 yrs) and a lower percent of females (48%) compared to CDNon-SURG (41 yrs; 59% female). CDSURG patients had higher hospitalization rates (38%) and incurred more health care expenditures ($15,112) during baseline compared to CDNon-SURG patients (23%; $13,400). During the last 6 months of follow-up, the percentage of CDSURG patients on biologics dropped to 44%; of the 56% in CDSURG who discontinued biologics, 31% received no treatment. In contrast, the percentage of CDNon-SURG patients continuing biologics decreased to 67% with 37% remaining on a "biologic only." **CONCLUSIONS:** Most CD patients (92%) initiated on biologics did not require surgery, however about one third stopped TNF antagonist treatment over 24 months. Although 8% of CD patients underwent surgery, they incurred high direct and indirect costs even prior to surgery. Even with availability of TNF antagonists, due to high discontinuation rate, there is an unmet need of effective CD treatment options that may delay or prevent disease progression.

PHS81

SURGERY AND BIOLOGIC USE PATTERN FOR ULCERATIVE COLITIS PATIENTS INITIATED WITH INFLIXIMAB IN A MANAGED CARE SETTING IN THE UNITED STATES

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OBJECTIVES: To identify patient demographics and treatment use patterns in patients with Ulcerative Colitis (UC) who initiated biologic treatment with infliximab in a managed care setting. **METHODS:** Patients with UC (ICD-9 code 556.X) who initiated infliximab between January 2007 and December 2008 were identified from the US IMPACT health insurance claims database. Two cohorts were identified based on whether they received UC related surgery (UCSURG) or did not receive a UC related surgery (UCNon-SURG) within a 24 month follow-up. All patients were continuously enrolled for both medical and pharmacy benefits during the 6 months prior to their first infliximab claim (index claim) and 24 months post index claim. **RESULTS:** A total of 264 individuals with UC were followed over 24-months, of which 84% did not receive surgery (UCNon-SURG) and 16% underwent surgery (UCSURG). In both cohorts, mean age was 42 years and 45% were women. The majority of patients (80%) were 18 to 54 years old with a higher proportion of UCSURG patients in the 35-44 year group range. During the 6-month baseline period, UCSURG patients had higher hospitalization rates (40%) and incurred more health care expenditures ($17,217) than UCNon-SURG (22%; $11,774). In the 24 month follow-up, 60% of patients within UCSURG underwent surgery during the first year following their index claim. Seventy percent of UCNon-SURG patients continued biologics with 34% remaining on "biologic only" compared to UCSURG, where 70% had no treatment. **CONCLUSIONS:** Most UC patients (84%) initiated on infliximab did not require surgery and continued biologic treatment (70%) over 24 months. Additional research is needed to further understand reasons for discontinuation of biologic treatment. Although 16% of UC patients underwent surgery, they incurred high direct and indirect costs even prior to surgery. There is an unmet need of effective UC treatment options that may delay or prevent disease progression.

PHS82

ASSOCIATION BETWEEN DRUG DEPENDENCE AND RADICAL PROSTATECTOMY COMPLICATIONS IN ELDERLY